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ABSTRACT

A comprehensive profile of the adult learner and his or her literacy performance was educed by examining factors that are manifestations of both the formal school experience and the environment. Multiple regression analysis was used to determine the tenability of 10 research hypotheses that each included one of the 10 literacy subtests of the Adult Performance Level Assessment. A secondary analysis was performed across sex and race subgroups to determine if the hypotheses were valid for those groups. Data were collected using four instruments: a demographic questionnaire, the Adult Performance Level Assessment, the Wesman Personnel Classification Test, and the Moos Family Environment Scale. The final sample was comprised of 76 adult basic education students attending a four-week summer school session in Montgomery county, Maryland. Four hypotheses involving literacy performance in community resources, consumer economics, government and law, and identification of facts and terms were accepted. The secondary analysis revealed that the selected factors had a differential influence on literacy performance for sex subgroups but not for race subgroups. The most important finding was that the environmental perceptions significantly influenced each of the 10 performance subtests. (Author/YLB)

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FACTORS INFLUENCING FUNCTIONAL LITERACY PERFORMANCE AMONG ADULT BASIC EDUCATION STUDENTS

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ABSTRACT

The functional literacy performance among a significant portion of American adults is considerably low. The purpose of this study was to educe a comprehensive profile of the adult learner and his or her literacy performance by examining factors which are a manifestation of both the formal school experience and the environment. The problem investigated was: How do selected developmental, academic, and environmental factors influence the functional literacy performance of adult basic education students?

Multiple regression analysis was used to determine the tenability of ten research hypotheses that each included one of the ten literacy subtests of the Adult Performance Level Assessment. A secondary analysis was performed across sex and race subgroups to determine if the hypotheses were valid for those groups.

One hundred and twenty-three ABE students who were attending a four-week summer school session in Montgomery county, Maryland comprised the initial sample. Data were collected between July 6 and July 27, 1982 inclusive and involved the following four instruments: (a) a demographic questionnaire, (b) the Adult Performance Level Assessment, (c) the Wesman Personnel Classification Test, and (d) the Moos Family Environment Scale. At the close of the data collection period, 76 adults had completed all four instruments and comprised the final sample.

Four hypotheses involving literacy performance in community resources, consumer economics, government-and-law, and identification of facts and terms were accepted. Alternate hypotheses for each of the ten literacy performance suggested factors which have more utility in understanding functional literacy performance than those factors hypothesized.

The secondary analysis revealed that the selected factors had a differential influence on literacy performance for sex subgroups but not for race subgroups. The most important general finding was that the environmental perceptions (current and past) held by ABE students significantly influenced each of the ten performance subtest and, in many instances, exerted a stronger influence than developmental and academic factors.

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INTRODUCTION

The functional literacy level of a significant portion of American adults is considerably low. The results of the Adult Performance Level (APL) project's 1971 national survey contained some alarming statistics. Using three competency levels (APL 1, 2, and 3) which corresponded, respectively, to three proficiency levels (adults functioning with difficulty, functioning adults, and proficient adults), Northcutt (1975) reported that 19.7% of the total adult population was functioning with difficulty and another 33.9% had less than proficient survival skills. Northcutt's data demonstrated that greater than 50% of the total adult population of the continental United States could perform basic literacy skills only at levels which were less than proficient.

The basic literacy skills necessary for adults to function successfully have been identified from the APL study. From that study, functional literacy is defined in terms of two dimensions--the application of a set of skills (reading, writing, computation, problem solving, and identification of facts and terms) to a set of general knowledge areas (government-and-law, consumer economics, health, occupational knowledge, and community resources).

Little doubt should exist that functional literacy is a major problem which deserves national attention. Current research has evoked a plethora of information on how a number of factors effect adult learning. Much is understood about the developmental functioning of adults, the influence of academic involvement on performance, and the sociodemographic characteristics of the adult learner. However, little is known about the influence that the environment in which the learner subsists exerts on his or her literacy performance. What is lacking in current research is an inclusion of environmental factors into a multivariate analysis of the adult learner and his or her literacy performance.

This study examined functional literacy performance among adult basic education students. More specifically, this research addressed four major categories of factors, i.e., developmental, academic, current background, and past background, which may influence an adult's functional literacy performance.

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Statement of the Problem

The problem investigated in this study was: How do selected developmental, academic, and environmental factors influence the functional literacy performance of adult basic education students?

Each of the three general factors requires clarification. The developmental and academic factors are each comprised of three variables. The environmental factor is more complex. Two broad categories of subfactors--current and past background--comprise the general environmental factor. The current background factor is subdivided into three subfactors which include: (a) a financial responsibility factor consisting of two variables, (b) an employment status factor consisting of two variables, and (c) a factor involving an adult's reasons for returning to school. The past background factor consists of ten variables which correspond to ten subsets of an adult's home environment. The following outline displays the individual variables for each of the selected factors:

I. Developmental Factor
   - A. Age
   - B. Intelligence (Verbal and Math)

II. Academic Factor
   - A. Number of years of formal education attained
   - B. Number of hours completed while attending prior adult basic education and/or vocational education classes
   - C. Time since last school experience

III. Current Background Factor
   - A. Financial responsibility
     1. Size of household family
     2. Total income of household family
   - B. Employment status
     1. Number of years of current employment
     2. Number of years of current unemployment
   - C. Reasons for returning to school

IV. Past Background Factor
   - A. Cohesion
   - B. Expressiveness
   - C. Conflict
   - D. Independence
   - E. Achievement orientation
   - F. Intellectual-Cultural orientation
   - G. Active-Recreational orientation
   - H. Moral-Religious orientation
   - I. Organization
   - J. Control

Purpose of the Study

By including environmental factors with factors which are generally understood to influence performance, the purpose of this study was to educe a comprehensive profile of the adult learner and his or her functional literacy performance. Using the ten subtests of the Adult Performance Level Assessment as dependent variables, focus was placed on the following objectives:

1. To observe the individual contribution which each independent variable makes on each of the ten performance subtests.

2. To observe the relative comparative contribution which each independent variable makes on each of the ten performance subtests.

3. To observe which combination of independent variables best influences each of the ten performance subtests.

4. To test the influence of the selected independent variables on each of the ten performance subtests across sex and race subgroups.

Theoretical Framework

The linear combination of specific variables was hypothesized to produce a significant multiple correlation with the adult performance level subtest scores. The rationale for hypothesizing these relationships came from an extensive review of the literature and became the theoretical framework of this study.

Hypotheses involving developmental variables derive their basis foremost from the theory of fluid and crystallized intelligence (Horn & Cattell, 1966). According to that theory, adults perform best on tests whose subtests require judgment, vocabulary usage, general knowledge, and arithmetic reasoning. Moreover, this performance advances with advancing age and experience. Since the academic variables have been found to be significant co-variates to the developmental variables (Birren & Morrison, 1961), developmental and academic variables were hypothesized together to influence specific literacy subtest scores.

The motivational models of Miller (1967), Rubenson (cited in Bergsten, 1980), and Boshier (1973) provide the framework for hypothesizing the influence of current background variables on specific functional literacy subtests. The central theory which emerges from these models is that adults engage in educational activities to satisfy extrinsic and intrinsic needs. The expectation that adult education participation will provide the skills which are necessary to meet their needs creates a strong motivation to learn.

The inference drawn from these models can be stated by the following example. An adult perceives that the extent of his financial responsibilities has affected his personal or family's status. Thus, he may engage in self-directed study or in a formal adult education class to learn the skills which are necessary to plan a family budget (e.g., consumer economics). Or, expecting a better job, he enrolls in adult education classes to develop his basic

skills that are prerequisite for better employment (e.g., occupational knowledge).

The environmental interaction theory generated by Lewin (1935), Bloom (1964), and Majoribanks (1979) which was subsequently supported by Dave (1963) and Wolf (1964) postulated that the home environment consists of subsets which influence specific psychological behaviors such as reading and arithmetic reasoning. Although exploratory for the adult learner, this framework allows for home environment subsets to be hypothesized to influence specific literacy subtest scores.

Hypotheses

The hypothesized relationships did not come from the review of related literature with the same strength; therefore, it was necessary to vary their levels of statistical significance. The influence of the developmental and academic variables on tests in general knowledge has been established in past research. The .01 level of significance was used when they were exclusively hypothesized to influence a performance subtest. Although home environment subset variables have been positively correlated with achievement subtests at significant levels in a few studies, their limited use in pedagogic research and their exploratory use in the present study warranted a .05 level of significance. The influence of current background variables on academic performance was inferred from motivation theory; therefore, the .10 level of significance was used when they were hypothesized to influence a performance subtest. The hypotheses are as follows:

1. A linear combination of age, verbal intelligence, formal educational attainment, and prior adult education experience will produce a significant ($p < .01$) multiple correlation with the community resources subtest scores.

2. A linear combination of age, verbal intelligence, formal educational attainment, prior adult education experience, and current background variables will produce a significant ($p < .10$) multiple correlation with the occupational knowledge subtest scores.

3. A linear combination of age, verbal intelligence, formal educational attainment, prior adult education experience, and current background variables will produce a significant ($p < .10$) multiple correlation with the consumer economic subtest scores.

4. A linear combination of age, verbal intelligence, formal educational attainment, and prior adult education experience will produce a significant ($p < .01$) multiple correlation with the health subtest scores.

5. A linear combination of age, verbal intelligence, formal educational attainment, and prior adult education experience will produce a significant ($p < .01$) multiple correlation with the government-and-law subtest scores.

6. A linear combination of age, verbal intelligence, formal educational attainment, and prior adult education experience will produce a significant ($p < .01$) multiple correlation with the identification of facts and terms subtest scores.

7. A linear combination of age, verbal intelligence, formal educational attainment, prior adult education experience, time since last school experience, and home environment subsets will produce a significant ($p<.05$) multiple correlation with the reading subtest scores.

8. A linear combination of age, verbal intelligence, formal educational attainment, prior adult education experience, time since last school experience, and home environment subsets will produce a significant ($p<.05$) multiple correlation with the writing subtest scores.

9. A linear combination of age, math intelligence, formal educational attainment, prior adult education experience, time since last school experience, and home environment subsets will produce a significant ($p<.05$) multiple correlation with the computation subtest scores.

10. A linear combination of age, verbal and math intelligence, formal educational attainment, prior adult education experience, and home environment, subsets will produce a significant ($p<.05$) multiple correlation with the problem solving subtest scores.

Procedures

Design

In this study, all independent variables were classified as attribute variables; therefore, an ex post factor research was employed. Measurements were taken on the dependent variables (functional literacy performance subtests scores) and on the independent variables (selected developmental, academic, and environmental variables). Inferences were drawn from the concomitant variation of the independent and dependent variables.

Instrumentation

Four data collection instruments were used in this study. These included a short questionnaire pertaining to demographic, academic, and current background variables; The Moos Family Environment Scale, for measuring the students' perceptions of ten subsets of their home environment; the Adult Performance Level Assessment, for measuring the ten literacy subtests, and the Wesman Personnel Classification Test, for measuring verbal and math intelligence. The questionnaire was pilot tested prior to its formal administration.

Sample

The initial sample was comprised of 123 adult basic education (ABE) students who were attending a four-week summer school session in Montgomery county, Maryland. At the close of the data collection period, 76 adults completed all four instruments and comprised the final sample.

The 30 males and 46 females in the final sample ranged between 16 and 56 years of age with greater than 50% of the sample below 24 years of age and 75% below 35 years of age. The mean age of the group was 28.1 years.

Educationally, greater than 50% of the sample completed 10 years of formal schooling and had been out of school for five years or less. Interestingly, one individual had been out of school for 42 years. Two-thirds of the adults had no prior adult education experience. Racially, there were 44 whites and 32 non-whites. Twenty-one of the non-whites were black.

Current background questionnaire responses described a group that was equally distributed along the total family income continuum. Although 10 adults refused to respond, 13 adults cited family incomes at less than $10,000 and 13 adults cited family incomes at greater than $30,000. The mean total family income was in the $14,000 to $22,000 bracket. These incomes reflected an average household size of four persons.

Current employment and unemployment among the group was almost equally distributed. Fifty-five percent were currently employed and 44% were currently unemployed. In the unemployed group, 17 adults had been unemployed for less than one year.

The final sample consisted of students who were participating in ABE primarily for the same extrinsic and intrinsic reasons as those adults reported by Burgess (1971) and Nickse (1976). Extrinsically, the final sample expected that participation would prepare them for a job (73%) and/or college (76%). Intrinsically, 80% of the adults responded that they were participating "to feel better about myself." Obviously the group was not participating to get away from home for a few hours (86% responded "not-at-all") or to meet new people (95% responded "not-at-all").

Data Analysis

Ten research hypotheses were stated in the following manner: The linear combination of X_1, X_2, ... X_k will produce a significant multiple correlation with the Y scores. Multiple regression analysis was used to meet the objectives of this study. All data were computer analyzed by the SPSS procedures. Specifically, each literacy performance score was regressed by the forward stepwise inclusion procedure on all of the independent variables.

In order to assess the unique contributions of sex and race, a secondary analysis of the data was performed. The ten multiple regressions were repeated across sex and race subgroups to determine if the ten hypotheses were valid for those groups.

Findings

Four of the ten research hypotheses were accepted. Included among those four were hypothesis one (community resources), hypothesis three (consumer economics), hypothesis five (government-and-law), and hypothesis six (identification of facts and terms).

The remaining six hypotheses were not accepted as stated. Included among those six were hypothesis two (occupational knowledge), hypothesis four (health), hypothesis seven (reading), hypothesis eight (writing), hypothesis nine (computation), and hypothesis ten (problem solving). A summary of the primary analysis is provided in Table 1.

TABLE 1

SUMMARY OF PRIMARY ANALYSIS FINDINGS

Hypotheses	Accepted[a]	Indep. Var.[b]	Sig. Var.[c]	n.s.[d]
1. Community Resources	Yes (.01)	4	4	-
2. Occupational Knowledge	No (.10)	16	15	Prior Ad. Ed. Exp.
3. Consumer Economics	Yes (.10)	16	16	-
4. Health	No (.01)	4	3	Formal Ed. Att.
5. Government-and-Law	Yes (.01)	4	4	-
6. Identification of facts and terms	Yes (.01)	4	4	-
7. Reading	No (.05)	15	13	Prior Ad. Ed. Exp.; Subset 2
8. Writing	No (.05)	15	13	Prior Ad. Ed. Exp.; Verbal IQ
9. Computation	No (.05)	14	13	Subset 4
10. Problem Solving	No (.05)	15	12	Age; Subset 2; Subset 3

[a] Parenthesized values indicate level of significance.

[b] Data indicate the number of the 29 independent variables hypothesized.

[c] Data indicate the number of hypothesized independent variables found to be significant.

[d] This column lists non-significant hypothesized independent variables.

The findings for each of the ten hypotheses suggested an alternate hypothesis which has more utility in understanding functional literacy performance. Current background variables and home environment subsets contributed greatly to the comprehensive understanding of functional literacy performance.

Age has little utility in understanding literacy performance in community resources, government-and-law, reading, writing, computation, and problem solving. Formal educational attainment has little utility in understanding occupational knowledge, consumer economics, and health. Functional literacy performance in community resources, government-and-law, and writing is not understood comprehensively by an ABE student's verbal intelligence. The prior adult education experience of an ABE student has little utility in understanding occupational knowledge, consumer economics, government-and-law, identification of facts and terms, reading, and writing.

The secondary analysis revealed that specific hypotheses which were not accepted for the total sample were accepted by specific subgroups and vice versa. Hypothesis four (health) was accepted for all subgroups except males and hypothesis nine (computation) was accepted only for males. Hypothesis three (consumer economics) and hypothesis seven (reading) were accepted only for the female subgroup.

The secondary findings for the racial subgroups was generally consistent. Except for hypothesis one (community resources), white and non-whites were consistent in terms of accepting or failure to accept the remaining nine hypotheses.

Conclusions

The findings of the primary and secondary analysis of the data suggest the following conclusions for adult basic education students:

1. Community resources performance is influenced primarily by an adult's math intelligence. Current background and home environment factors influence that performance more than the influences of age, verbal intelligence, and formal educational attainment.

2. Occupational knowledge performance is influenced primarily by developmental (age, verbal intelligence, and math intelligence) and current background factors. Developmental, current background, and home environment factors influence that performance more than the influence of the academic factor.

3. Consumer economics performance is influenced primarily by verbal intelligence, current background factors, and home environment perceptions These factors influence consumer economic performance more than the influence of academic factors.

4. Health performance is influenced primarily by an adult's verbal intelligence, math intelligence, and time since last school experience. The time that has elapsed since an adult's last school experience is more important in understanding health performance than an adult's formal educational attainment and prior adult education experience.

5. Government-and-law performance is influenced primarily by an adult's formal educational attainment; however, an inverse relationship exists between that performance and formal educational attainment. The home environment and current background factors play important roles in influencing government-and-law performance.

6. Identification of facts and terms performance is influenced primarily by an adult's total family income, verbal intelligence, and age. Formal educational attainment and home environment perceptions play important roles in an adult's performance of that skill.

7. Reading performance is influenced primarily by an adult's verbal intelligence. The time that has elapsed since an adult's last school experience is more important to his or her reading performance than his or her prior adult education experience. Current background and home environment perceptions play important roles in an adult's reading performance.

8. Writing performance is influenced primarily by an adult's formal educational attainment; however, an inverse relationship exists between that performance and formal educational attainment. The home environment and current background factors play important roles in influencing writing performance. An adult's verbal intelligence and prior adult education experience do not influence his or her writing performance.

9. Computation performance is influenced primarily by developmental, academic, current background, and home environment factors. The adult's age and time since last school experience, however, have little utility in understanding an adult's computation performance.

10. Problem solving performance is influenced primarily by an adult's math intelligence. Verbal intelligence, academic factors, and home environment factors play important roles in influencing an adult's problem solving performance. Age, however, has little utility in understanding that performance.

11. Sex is a distinguishing factor in the functional literacy performance of ABE students.

12. Race is not a distinguishing factor in the functional literacy performance of ABE students.

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